

Index of Contributors

Acosta, A. A., 119-122
Alfthan, H., 544-550
Al-Hasani, S., 88-95

Baeckeland, E., 80-87
Bastin, F., 420-428
Baukloh, V., 227-235, 240-250
Bayly, C. M., 123-127, 140-145, 490-503
Beier, H. M., 153-167
Belaisch-Allart, J., 128-139
Birkenfeld, A., 153-167
Boer-Meisel, M.E., 533-535
Bohnet, H. G., 227-235, 240-250
Bologne, R., 146-152
Bolton, T., 205-211
Bränström, M., 73-79
Brosens, I., 310-317
Brown, J. B., 391-401

Castanier, M., 128-139
Chen, C., 420-428
Chia, C. M., 251-264
Clarke, G. A., 123-127, 140-145, 490-503
Clarke, G. N., 490-503
Cohen, Jacques, 342-351
Cohen, Jean, 336-341
Collins, R. L., 23-37
Cooke, I. D., 387-390
Coppo, M., 416-419

Daume, E., 73-79
DeCherney, A. H., 504-522
de L'Aune, W., 504-522
Demoulin, A., 146-152
Devroey, P., 304-309
Diedrich, K., 88-95
D'Lugi, A., 504-522
Dor, J., 476-486
Dorfmann, A., 466-475
du Plessis, Y. P., 140-145

Eder, A., 523-532
Edirisinghe, W. R., 251-264
Edwards, R. G., xi, 1-22, 342-356, 564-570,
571-572
Enk, L., 182-194
Evans, M. I., 466-475

Fazio, D., 504-522
Fehilly, C., 342-356
Feichtinger, W., 227-235, 240-250, 445-454
Ferrier, A., 440-444

Fishel, S. B., 342-356
Forde, C., 420-428
Fredga, K., 455-457
Friberg, J., 168-177
Frydman, R., 128-139

Garcia, J. E., 119-122
Gidley-Baird, A. A., 429-439
Gleicher, N., 168-177
Goldman, B., 476-486
Gordts, S., 310-317
Gosden, R. G., 45-57
Graebe, R., 504-522
Greenfeld, D., 504-522
Gronow, M. J., 123-127, 381-386, 391-401
Grudzinskas, J. G., 38-44, 205-211, 269-275,
287-292
Guillet-Rosso, F., 128-139

Habbema, J. D. F., 533-535
Hamberger, L., 182-194
Hamerich, U., 88-95
Hanf, V., 551-557
Haseltine, F. P., 504-522
Hay, D., 391-401
Heesch, W., 240-250
Heinonen, P. K., 236-239
Hillensjö, T., 73-79
Hodgen, G. D., 23-37
Hoffman, D., 112-118
Hull, M. G. R., 318-323
Hunt, J., 490-503
Hustin, J., 146-152

Isotalo, H., 408-415

Jansen, R. P. S., 595-600
Johnston, W. I. H., 123-127, 140, 145,
490-503
Jones, E. E., 504-522
Jones, H. W., Jr., 375-380, 577-582
Jones, W. R., 420-428
Joyce, D. N., 318-323
Juikunen, M., 212-226, 402-407
Junca, A.-M., 336-341
Juva, M., 585-587

Kardaun, J. W. P. F., 533-535
Kauppila, A., 408-415
Kemeter, P., 227-235, 240-250, 445-454,
523-532
Kenigsburg, D., 23-37

- Kerin, J. F., 195-204
 Kirby, C., 195-204
 Koistinen, R., 212-226
 Koskimies, A. I., 212-226, 402-407, 544-550
 Krebs, D., 88-95
 Kujansuu, E. T., 236-239
- L**ambotte, R., 146-152
 Landgren, B.-M., 387-390
 Larsson, E., 265-268, 324-331
 Laufer, N., 504-522
 Law, H. Y., 251-264
 Leeton, J. F., 293-300
 Lefèvre, B., 128-139
 Lehmann, F., 88-95
 Lenton, E. A., 387-390
 Lenz, S., 368-374
 Levran, D., 140-145
 Liedholm, P., 324-331, 455-457
 Lindenberg, S., 368-374
 Lopata, A., 140-145, 381-386
 Lövgren, T., 544-550
- M**agnusson, C., 73-79
 Mahadevan, M. M., 293-300
 Mandelbaum, J., 336-341
 Marrs, R. P., 112-118
 Martikainen, H., 408-415
 Martin, M. J., 123-127, 140-145, 381-386, 391-401
 Mashiach, S., 476-486
 Masters, J., 504-522
 Mazure, C., 504-522
 McBain, J. C., 123-127, 140-145, 381-386, 490-503
 McDermott, A., 318-323
 McLeod, F. N., 318-323
 McNatty, K. P., 205-211
 Merveille, C., 80-87
 Mettler, L., 458-465, 551-557
 Michelmann, H. W., 458-465
 Mohr, L. R., 536-543
 Mootz, U., 153-167
 Moro, D., 391-401
- N**aaktgeboren, N., 304-309
 Nayudu, P., 140-145
 Nebel, L., 476-486
 Nero, F., 504-522
 Ng, S. C., 251-264
 Nikkanen, V., 301-303
 Nielsen, M. H., 368-374
 Nilsson, B. O., 324-331
 Nilsson, L., 73-79
 Nilsson, O., 265-268
 Nysenbaum, A. M., 38-44
- O**ke, K., 490-503
 O'Neill, C., 429-439
 Ongkowidjojo, R., 310-317
 Osteen, K. G., 332-335
 Overduin, D. Ch., 583-584
- P**ereda, J., 416-419
 Pettersson, K., 544-550
 Pijnenborg, R., 310-317
 Pike, I. L., 429-439
 Plachot, M., 336-341
 Polan, M. L., 504-522
 Porter, R. N., 429-439
 Punnonen, R. H., 236-239
 Purdy, J. M., 342-356
 Pystynen, P. P., 236-239
- Q**uigley, M. M., 96-111
 Quinn, P., 195-204
- R**atnam, S. S., 251-264
 Ray, B. D., 318-323
 Renard, A. M., 80-87
 Rogers, B. J., 332-335
 Rönnerberg, L., 408-415
 Rosenwaks, Z., 119-122
 Rudak, E., 476-486
 Rutanen, E.-M., 212-226, 402-407
- S**alat-Baroux, J., 336-341
 Sathananthan, A. H., 251-264
 Saunders, D. M., 205-211, 269-275, 287-292, 429-439, 440-444
 Schenken, R. S., 23-37
 Schenker, J. G., 601-607
 Scholz, W., 551-557
 Schulman, J. D., 466-475
 Seegar Jones, G. E., 119-122
 Semm, K., 551-557
 Seppälä, M., xi, 212-226, 287-292, 402-407, 544-550, 558-563
 Singer, P., 588-594
 Sinosich, M. J., 205-211, 269-275, 287-292, 429-439, 440-444
 Sjöberg, J., 212-226, 402-407
 Sjögren, A., 73-79
 Smith, S. K., 387-390
 Speirs, A. L., 123-127, 140-145, 381-386, 490-503
 Springer-Kremser, M., 523-532
 Sreemathi, C., 73-79
 Stanger, J. D., 269-275
 Staves, R. P., 551-557
 Stenman, U.-H., 544-550
 Steptoe, P., 178-181, 487-489, 573-576

Sundström, P., 265-268, 324-331
Suni, J., 265-268
Suominen, J. J. O., 301-303

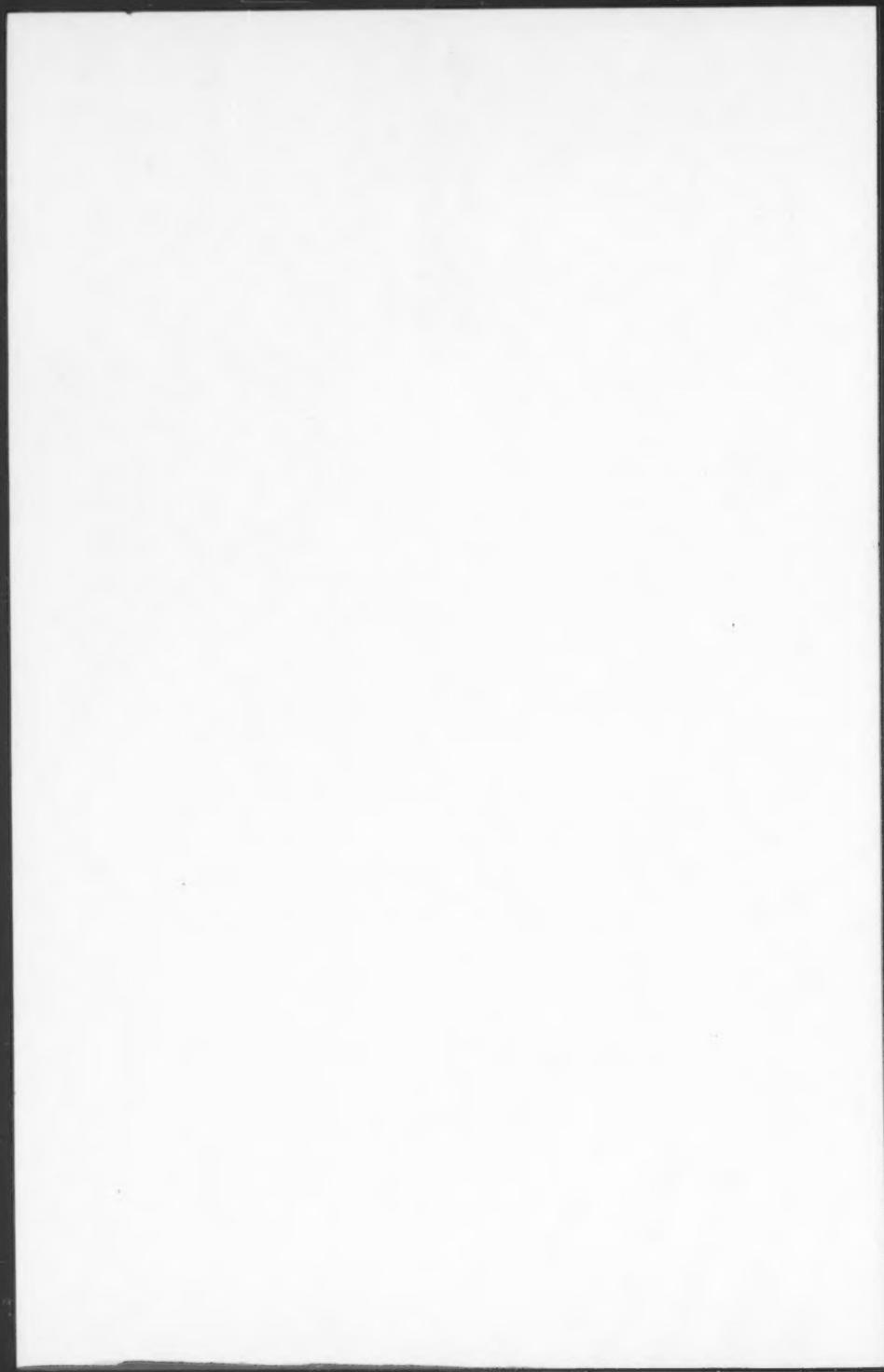
Tarlatzis, B., 504-522
Teisner, B., 205-211
Tenhunen, A., 212-226, 402-407
Testart, J., 128-139
te Velde, E. R., 533-535
Tinneberg, H. R., 551-557
Törnell, J., 73-79
Trapp, M., 240-250
Trounson, A. O., 293-300, 536-543

Vaheri, A., 265-268
van Blerkom, J., 58-72
van der Ven, H. H., 88-95
van Steirteghem, A. C., 304-309
Vargyas, J. M., 112-118
Vaughn, W. K., 332-335
Veeck, L. L., 357-367

Vihko, R., 408-415
Viinamäki, O., 236-239

Wahlström, T., 212-226, 402-407
Walters, D. E., 342-356
Warnes, G. M., 195-204
Weber-Benndorf, M., 153-167
Webster, B. W., 332-335
Webster, J., 178-181
Wein, P., 381-386
Wentz, A. C., 332-335
Westergaard, J., 205-211
Westergaard, L., 205-211
Wiklund, M., 182-194
Wood, C., 293-300
Wramsby, H., 455-457

Yee, B., 112-118
Yki-Järvinen, H., 402-407
Yovich, J. L., 276-286
Yovich, J. M., 276-286



Subject Index

- A**bdominal transducers in ultrasound follicular aspiration, 186–88
Abortion
 clinical, rates of, 471
 maternal age and rates of, 493
 spontaneous, *see* Pregnancy—failure of
Age, *see* Maternal age
Albumin in follicular fluid, 271
Anesthesia in ultrasound follicular aspiration, 186
Aneuploidy, 48, 50–51
Antibodies, sperm, in follicular fluid, 301–3
Aspiration
 follicle
 pregnancy proteins in endometrium after, 402–7
 using ultrasound, 182–94
 laparoscopic follicular, 98–99
 laparoscopy in, 179–80
Atresia, follicle loss by, 45–46
Autonomous expression in early mammalian embryo, 58–72
- B**iocides in follicular fluid, 240–50
Biological basis of ethical debates, 565–66, 596–99
Blastocysts
 growth rates of, 351–52
 implantation of, 368–74
Blastomeres, cytoplasmic organelles at surface of, 416
- C**-type retrovirus-related P-30 protein in follicular fluid, 265–68
Chiasma frequency, 48
Chromosomal abnormalities, percent of conceptuses with, 467
Chromosome analysis of oocytes, 476–86
Chromosome studies of embryos, 458–65
Chromosomes
 imbalance of, during meiosis, 48
 preparation from embryos of, 483–84
 preparation from oocytes of, 455–57, 479–83
Chymotrypsin, 273
Cleavage, 9
 failure of, in immature oocytes, 363–64
 rate of, pregnancy and, 11–12
Clomiphene
 effects of
 on oocyte fertilizability and preovulatory follicles, 128–39
 on oviductal and uterine mucosa, 153–67
- embryo transfer rate and, 382
endometrial receptor kinetics changed by, 408–15
follicle growth stimulated using, 2–5, 112–18
and hMG stimulation, 141
pregnancy rates and, 143–44
rise in response to, 142
Cohorts, definition of, 25
Conceptuses, donor, sources and potential function of, 580–81
Corona cells, sperm phagocytosis by, 310–17
Cortical granules, distribution of, in oocytes, 251–64
Cortical reaction, 91
Cryopreservation of embryos, 536–42
Culture factors, success rate and, 195–204
Cumulus expansion, 358–60
Cyclic AMP, follicular fluid synergism with, 77
Cytoplasmic organelles at blastomere surface, 416
Cytoplasmic reorganization, intrinsic program and, 65–69
Cytoskeletal mediation for intrinsic program, 64–65
Cytosol, 408–15
- D**ispermic fertilization, triploid embryos as result of, 332–35
DMSO, cryopreservation with, 539
DNA probes, embryo typing using, 10–11
Dominance, definition of, 27
Donor sperm, use of, 579–80
Down's syndrome, 48
Dysmenorrhea, 527
- E**arle's medium, fertilization sustained using, 7
Early ongoing pregnancy, luteal phases of, ultrasonic and hormonal evaluation of, 445–54
Early pregnancy factor
 embryo monitoring using, 420–28
 test system to determine, 551–57
Elastase, 273
Electron microscopy, blastocyst implantation and, 370
Embryo replacement
 clinical comparisons, 13–17
 maternal age and, 12–13
 treatment program for, agents in, 96–111

- Embryo transfer, culture factors and, 195–204
Embryo typing, DNA probes in, 10–11
Embryogenesis by intrinsic program
 developmental evidence for, 58–59
 molecular evidence for, 59–64
Embryos
 blastocyst cleaving of, growth rates of, 353
 chromosome preparation from, 483–84
 chromosome studies of, 458–65
 cryopreservation of, 536–42
 early development of, extragenomic regulation and autonomous expression of, 58–72
 endometrial status at transfer of, 378
 fate after transfer of, 420
 growth of, rate analysis for, 343–44
 impaired development of, after abnormal *in vitro* fertilization, 336–41
 karyotyping of, 472
 multiple transfer of, 381–86
 in vitro development of, factors influencing, 342–56
 monitoring of, using early pregnancy factor, 420–28
 postimplantation viability of, 440–44
 production of, ovarian stimulation methods for, 112–18
 quality of, implantation and, 11–12
 triploid, as result of dispermic fertilization, 332–35
 two-cell, ultrastructure of, 416–19
variables in transfer of, 375–79
viability of, monitoring methods for, 429–39
Endocrine indices, conceptual cycles identified by, 140–45
Endocrinology of follicular phase, 2–6
 abandonment of, 5
Endometrial receptor kinetics, clomiphene-induced changes in, 408–15
Endometrial status at transfer of embryos, 378
- F**ertility
 in rats, ultrasound influence on, 147, 150–51
 restoral after sterilization of, 488
 synchronization and, 161
Fertilization, dispermic, triploid embryos as result of, 332–35
Fertilization rates
 pollutants and, 244
 polyspermy and, 89–91
Fimbrial obstruction, tubal surgery for, 533–35
Flow cytometric granulosa cell DNA analysis, 206
Follicle stimulating hormone, *see* FSH
Follicles
 aspiration of, using ultrasound, 182–94
 classification of, 206–8
 clomiphene citrate for development of, 112
 development of, FSH and LH effects on, 119–22
 enhanced recruitment of, 96–111
 graafian, *see* Graafian follicles
 growth of, ultrasound monitoring of, 146–52
 oocyte maturation and, 73–79
 origin of, oocyte cleavage relationship to, 134–35
 ovarian, *see* Ovarian follicles
 preovulatory
 clomiphene effect on, 128–39
 population analysis of, 130–33
 rank of, hormonal content and, 133–34
 size of, hormonal content and, 130
 ultrasound effect on, 151
Follicular fluid
 biocides in, 240–50
 C-type retrovirus-related P-30 protein in, 265–68
 leakage of, laparoscopy and, 179
 oocyte maturation and, 73–79
 placental proteins in, 216
 plasma protein-A and placental protein 5 in, 269–75
 plasma protein-A in, 221
 polyspermy and, 332–35

- prolactin and sex steroid concentrations in, 227-35
radioimmunoassays of, 213-14
sperm antibodies in, 301-3
- Follicular phase, endocrinology of, 2-6
- Follicular recruitment, agents for, 96-111
- Follicular steroids, P-30 protein relationship to, 265-69
- Follicular stimulation, 2-5
extracorporeal maturation and, 357-67
oocyte recovery and, 342-43, 345-46
- Folliculogenesis, definition of, 24
- Freezing of embryos, 536-42
- FSH
effects on follicular development and oocyte retrieval of, 119-22
elevated levels of, ovarian failure and, 175-76
gonadotropic stimulation and, 28
ovarian dose-dependent effects of, 23-24
urinary, 33
- Fungicides, 241
- G**enetic aspects of *in vitro* fertilization, 466-75
- Gestational sacs, 451
- Glycerol, cryopreservation with, 539
- Glycoproteins
in follicular fluid, 269-75
tumor granulosa cell synthesis of, 271-72
- GnRH antagonist, medical hypophysectomy by, 31-33
- Golgi complexes, cortical granules and activity of, 251-64
- Gonadotropin stimulation
of ovarian/menstrual cycle, 28
of ovaries, 88-89, 92-93
ovulation induction and, 28-31
- Gonadotropins, estrogen deficiency and, in menopause, 174
- Graafian follicles, production of, 45-48
- Gradual fixation technique, 455
- Granulocyte elastase, 223
- H**CG, maternal blood detection of, pregnancy diagnosis and, 40-41
- Helsinki statement on *in vitro* fertilization, 571-72
- Heparin, 272
- Historical aspects concerning *in vitro* fertilization ethics, 573-76
- hMG
addition to clomiphene of, ovarian stimulation and, 128-39
embryo transfer rate and, 382
follicle growth stimulated using, 2-5
ovulation induction with, in perimenopausal women, 168-77
- pregnancy rates and, 143-44
rise in response to, 142
stimulation with, 141
- Hormonal assays in follicular recruitment, 98
- Hormonal correlates with polyspermy, 332-35
- Hormonal enhancement of natural cycle, dominant ovarian follicle selection and, 23-37
- Hormonal evaluation of luteal phase, 445-54
- Hormone measurements
follicular-phase, 100-102
luteal-phase, 105
- Hormones
follicle rank and, 133-34
follicle size and, 130
- Hormonogenesis, definition of, 24-25
- Human chorionic gonadotropin, *see* hCG
- Human menopausal gonadotropin, *see* hMG
- Hydroxysteroid dehydrogenase, 408-15
- Hyperemia, capillary permeability with, implanting embryo and, 51-53
- Hyperstimulation
luteal phase after, 391-401
oocyte dispermmy incidence from, 9
- I**диopathic sterility, 524-25
- Immune infertility, 304-9
- Immune system, sex gland secretions and, 287
- Immunofluorometric assay, LH surge monitored by, 544-50
- Immunoperoxidase staining, 214-15
- Implantation
clinical comparisons, 13-17
embryo quality and, 11-12
growth after, 21
maternal age and, 12-13
pregnancy failure after, 38-44
- In vitro* fertilization
abnormal, impaired embryo development after, 336-41
culture factors and success rate of, 195-204
ethical issues concerning, 1-2, 318-23, 564-70, 577-82, 583-84, 585-87, 588-94, 595-600
historical aspects of, 573-76
genetic aspects of, 466-75
Helsinki statement on, 571-72
overview of, 7-9
patient selection in, 487-89
physical and psychological aspects of, 490-503
psychological interviews for, 504-22
psychosocial testing for, 523-32
World Collaborative Report on, 558-63
- Infertility
causes of, 559
male, *see* Male infertility
oligospermic, management of, 276-86

- pathogenetic concept of, 527-30
psychological problems associated with, 498-502
unexplained, 318-23
successful delivery after, 489
- Insecticides, 241
- Intrauterine environment, maternal age and, 51-53
- Intrinsic program
cytoplasmic reorganization and, 65-69
cytoskeletal mediation for, 64-65
embryogenesis by
developmental evidence for, 58-59
molecular evidence for, 59-64
- Islam, *in vitro* fertilization and, 601-7
- J**udaism, *in vitro* fertilization and, 601-7
- K**aryotyping of embryos, 472
- L**aparoscopic follicular aspiration, 98-99
- Laparoscopy
follicular estrogen levels before, 347
for oocyte recovery, 178-81
- Legal issues concerning *in vitro* fertilization, 571-72
- LH
effects on follicular development and oocyte retrieval of, 119-22
ovarian dose-dependent effects of, 23-24
- LH surge, 5-6
monitoring by immunofluorometric assay of, 544-50
preovulatory, blockade of, 28
- Uteal phase
after hyperstimulation, 391-401
short, as defect, 387-90
ultrasonic evaluation of, 445-54
- Luteinizing hormone, *see LH; LH surge*
- Lymphocytes, early pregnancy factor binding to, 421-22
- Lysosomes, cortical granules and, 258, 262
- M**ale infertility, 9, 276-86
in vitro fertilization and, 293-300, 304-9
- Males, sperm count in, 276
- Masturbation, 590, 603
- Maternal age
abortion rates and, 493
cytogenetic abnormalities and, 468
embryo replacement and, 12-13
embryonic development and, 346
as factor affecting pregnancy outcome, 45-57
- Maternal environment, embryo quality and, 11-12
- Medical hypophysectomy by GnRH antagonist, 31-33
- Meiosis, molecular aspects of, 59-64
- Menopause, estrogen deficiency in, 174
- Menstrual cycle, *see Ovarian/menstrual cycle*
- Methylprednisolone, male infertility treated with, 304-9
- Microfilament activity, cortical granules and, 251-64
- Mitochondria, stage-related translocations of, 69
- Mixed antiglobulin reaction, 305
- Mouse zygote culture, 196-97, 198-200
- Mucosa, oviductal and uterine, clomiphene effect on, 153-67
- Multipregnancy, 17-21
- Multipronuclear oocytes
cleavage arrest and incidence of, 353-54
oocyte maturity and incidence of, 479
- N**eedles in ultrasound follicular aspiration, 185-86
- Nuclear estrogen, 408-15
- Nucleolar activity, cortical granules and, 251-64
- Nucleolar structure, modification of, of rat oocyte, 80-87
- Nucleoplasmic components, developmental program and, 63
- O**ligospermia
circumvention of, 488-89
definition of, 278
- Oligospermic infertility, management of, 276-86
- Ontogenetic changes during early development, 60-63
- Oocyte donation, ethical issues concerning, 2
- Oocyte recovery, 6-7
follicular stimulation and, 342-43, 347-49
laparoscopy for, 178-81
- Oocytes
activation of, fertilization abnormalities and, 337-38
chromosomal preparations from, 455-57, 479-83
chromosome analysis of, 476-86
cleavage of, follicular origin relationship to, 134-35
corona cell separation from, 310-17
cortical granules in, 251-64
cultures for fertilization of, 195-204
dispermy in, 9
donor, use of, 580
extracorporeal maturation and, 357-67
fertilizability of, clomiphene effects on, 128-39
immature, cleavage failure in, 363-64

- maturity of, multipronuclear oocyte incidence and, 476
ontogenetic changes and, 63–64
organization of, 253–55
polyspermy in, 88–95, 332–35
preovulatory, fertilization lacking in, 456
production of, ovarian stimulation methods for, 112–18
quality of, maternal age and, 48–51
rat, modification of nucleolar structure of, 80–87
retrieval of, FSH and LH effects on, 119–22
ultrastructure of, 324–31
uncleaved, fertilization proof in, 458–65
Organelles, cytoplasmic, at blastomere surface, 416
Ovarian follicles
dominant, selection of, 23–37
plasma protein-A in, 205–11
Ovarian function, follicular store size and limitation of, 47–48
Ovarian/menstrual cycle
functional disorders of, 523–24
gonadotropic stimulation of, 28
hormonal enhancement of, dominant ovarian follicle selection and, 23–37
irregularities in, ovulation induction and, 168–77
luteal-phase length in, 387–90
Ovarian stimulation
gonadotropic, 88–89, 92–93
oocyte and embryo production and, 112–18
ovum collection after, endometrial receptor kinetics and, 408–15
prolactin and sex steroid concentrations after, 227–35
regimens of, comparative analysis of, 123–27
Ovaries
pregnancy proteins in, 212–26
vasopressin in, 236–39
Oviductal mucosa, clomiphene effect on, 153–67
Ovulation, follicle recruitment for, 46–47
Ovulation induction, 28–31
using hMG, in perimenopausal women, 168–77
Oxytocin, 238
- P**
 P_30 protein, follicular steroids and, 265–69
Perimenopausal women, ovulation induction in, using hMG, 168–77
Phagocytosis, sperm, by corona cells, 310–17
Placental protein 5
plasma protein-A and, in follicular fluid, 269–75
in seminal plasma, 287–92
Placental proteins
in endometrium, 402–7
in follicular fluid, 216, 219
immunoperoxidase localization of, 218
in seminal plasma, 215–16, 218
Plasma E₂ assay, 124
Plasma progesterone, short luteal-phase levels of, 387
Plasma protein-A
in endometrium, 402–7
in follicular fluid, 221
immunoperoxidase staining of, 221–22
placental protein 5 and, in follicular fluid, 269–75
postimplantation embryo viability and, 440–44
pregnancy-associated, in ovarian follicles, 205–11
in seminal plasma, 219–21, 287–92
Plasma vasopressin, ovarian activity role of, 236–39
Plasminogen, placental protein 5 influence on, 272
Platelet counts, 430
embryo-derived platelet activating factor and, 432–33
reduction after *in vitro* fertilization of, 434
Platelet-activating factor, assay for, 430–31
Pollutants in follicular fluid, 240–50
Polyploidy, chromosome analysis to confirm, 458–62
Polyspermy
cortical granules in prevention of, 251
hormonal correlates with, 332–35
in vitro fertilization risk of, 469
in oocytes, 88–95
Postcoital sperm/mucus penetration, 318–23
Pregnancy
early
diagnostic tests of, 40–41
ultrasonic evaluation of, 445–54
ectopic, clomiphene-induced ovulation and, 153
failure of
clinical considerations, 42–43
fecundability and, 41–42
after implantation, 38–44
maternal age and, 468
in vitro cleavage rate and, 11–12
intruterine deaths in, 467
maternal age factor and, 45–57
maternal recognition of, 429–39
oligospermic infertility and, 276–86
previous, psychological effects of, 492
quadruplet, 385
rates of
clomiphene and hMG and, 143–44

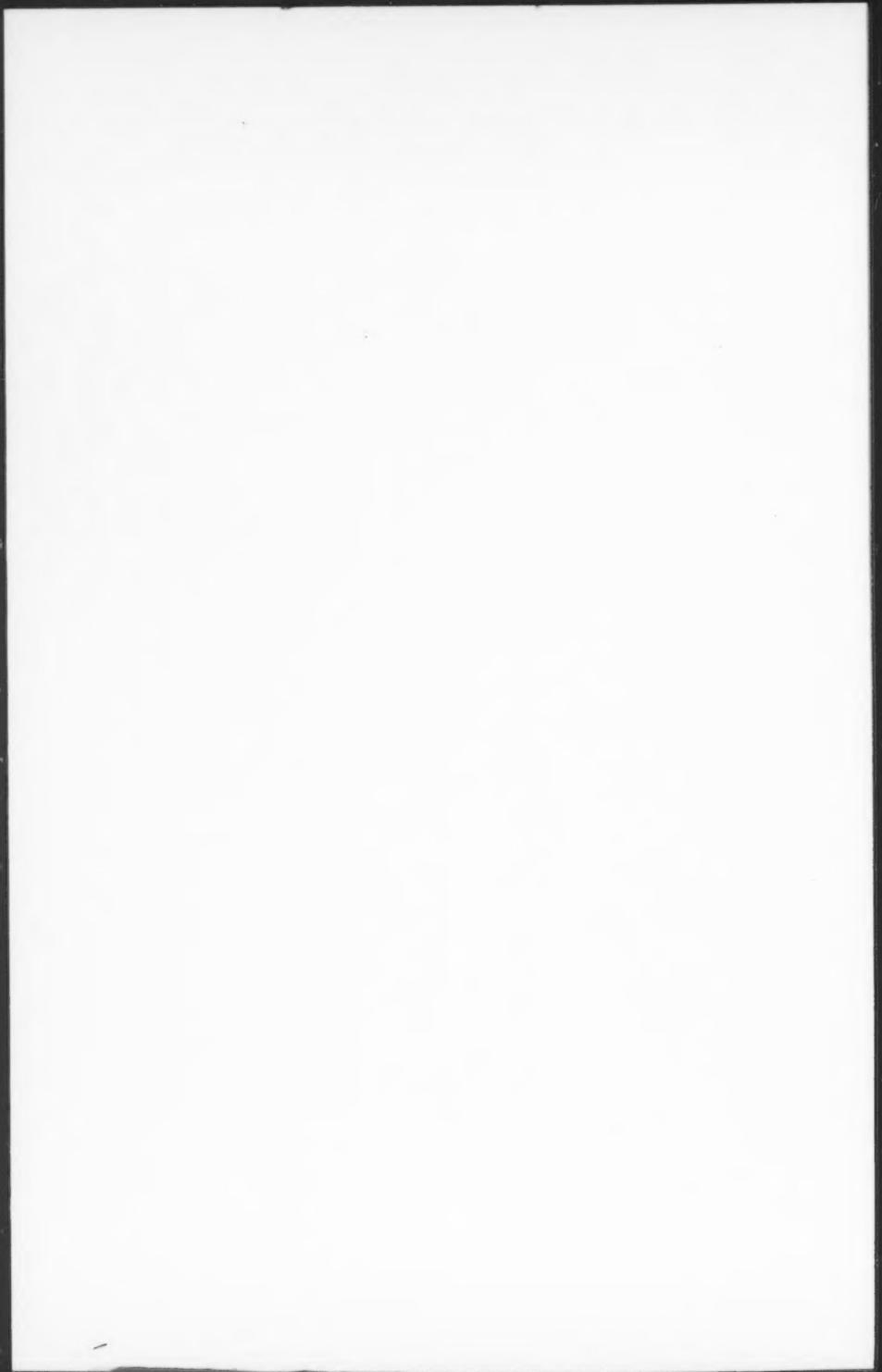
- ultrasound influence on, 146
- See also Multipregnancy*
- Pregnancy proteins, 212-26
 - in endometrium, after follicle aspiration, 402-7
- Preovulatory follicular fluid, pregnancy proteins in, 212-26
- Preovulatory oocytes, 326-31
- Progesterone, premature rise of, 33
- Progesterin receptors, 408-15
- Prolactin in follicular fluids, 227-35
- Prostaglandins, oxytocin secretion stimulated by, 238
- Protease inhibitors, 287-92
- Protein phosphorylation, 64-65
- Protein synthesis, ontogenetic changes in, during early development, 60
- Psychological aspects of patient selection, 490-503
- Psychological interviews for *in vitro* fertilization, 504-22
- Psychosocial testing for *in vitro* fertilization, 523-32
- Puncture techniques, ultrasound-guided, 182-88
- Q**uadruplet pregnancy, 385
- R**ecruitment, definition of, 25-26
- Religion, ethical issues viewed by, 583-84, 589-90, 601-7
- RNA, synthesis in oocyte of diminishment of, 85-86
 - progression of, 260, 262
- Rosette inhibition assay
 - early pregnancy factor detected by, 421
 - methodology of, 423-24
- S**alpingectomy, 488
- Sclerosis, fetal survival and, 53
- Selection, definition of, 26-27
- Semen, quality of
 - glycoproteins and, 288-89
 - in vitro* fertilization and, 293-300
- Seminal plasma
 - plasma protein-A and placental protein S in, 287-92
 - pregnancy proteins in, 212-26
- Seminal vesicles, pregnancy proteins in, 212-26
- Serum, preparation of, in early pregnancy factor assays, 422-23
- Sex steroids in follicular fluids, 227-35
- Sperm
 - capacitation of, 305
 - collection of, 305
 - count for, 276
 - donor, use of, 579-80
- impaired penetration of, 318-23
- motility of, 293, 299
- polyspermy and, 90
- Sperm agglutination, 301-3
- Sperm antibodies in follicular fluid, 301-3
- Sperm phagocytosis by corona cells, 310-17
- Spontaneous abortion, *see* Pregnancy—failure of
- Stenosis, fetal survival and, 53
- Sterility
 - idiopathic, 524-25
 - pathogenetic concept of, 527-30
 - tubal, 525-27
- Sterilization, fertility restoral after, 488
- Steroid receptors, implantation role of, 414
- Steroids
 - assay of, 206
 - follicular, P-30 protein relationship to, 265-69
 - luteal-phase peak of, 399
 - oocyte fertilization and, 77
 - polyspermy and, 334
 - sex, in follicular fluids, 227-35
- Stimulation
 - follicular, 2-5
 - gonadotropic, of ovarian/menstrual cycle, 28
- Stromal cells, epithelial cells outgrown *in vitro* by, 372
- Superovulation, 469
- Surrogate motherhood, 581-82, 593
- T**amoxifen, 412
- Thrombin, 272
- Thrombocytopenia, 438
- Transvaginal puncturing procedures, 187-88
- Transvesical puncturing procedures, 186-87
- Tray agglutination test, 305
- Triploidy, 338-40
 - spontaneous abortion frequency of, 468
- Trisomic conceptuses, 48
- Trypsin, 223
- Tubal problems, percent of patients with, 487
- Tubal sterility, 525-27
- Tubal surgery, *in vitro* fertilization impact on, 533-35
- Tumor granulosa cells, glycoprotein synthesis by, 271-72
- U**ltrasonic evaluation of luteal phase, 445-54
- Ultrasound, 113-14
 - equipment for, 183
 - follicular aspiration using, 182-94
 - follicular growth monitored by, 146-52
- Ultrasound gel, 186

Ultrastructure
of oocytes, 324-31
of two-cell embryos, 416-19
Univalents, oocytes containing, frequency of,
48-49
Urine, LH in, 549-50
Uterine epithelial monolayer culture, 369
Uterine luteal-phase anteroposterior diameter,
447
Uterine mucosa, clomiphene effect on, 153-67
Uterus
cellular and morphologic changes in, maternal age and, 51
surrogate, 581-82, 593

Vasopressin, ovarian activity role of, 236-39

Water, quality of, culture mediums and,
201
World Collaborative Report on *in vitro* fertilization, 558-63

Zona pellucida, sperm binding to, 339-40
Zygote culture, mouse, 196-97, 198-200



ANNALS OF THE NEW YORK ACADEMY OF SCIENCES

Volume 442

May 28, 1985

**IN VITRO FERTILIZATION AND
EMBRYO TRANSFER^a**

Editors

MARKKU SEPPÄLÄ AND R.G. EDWARDS

CONTENTS

Preface. By MARKKU SEPPÄLÄ AND R. G. EDWARDS	xii
--	-----

Part I. General Introduction and Background

In Vitro Fertilization and Embryo Replacement: Opening Lecture. By R. G. EDWARDS	1
Selection of the Dominant Ovarian Follicle and Hormonal Enhancement of the Natural Cycle. By GARY D. HODGEN, DANIEL KENIGSBURG, ROBERT L. COLLINS, and ROBERT S. SCHENKEN	23
Failure of Human Pregnancy after Implantation. By J. G. GRUDZINSKAS and A. M. NYSENBAUM	38
Maternal Age: A Major Factor Affecting the Prospects and Outcome of Pregnancy. By ROGER G. GOSDEN	45

Part II. Maturation of Mammalian Germ Cells

Extragenomic Regulation and Autonomous Expression of a Developmental Program in the Early Mammalian Embryo. By JONATHAN VAN BLERKOM..	58
Oocyte Maturation as Regulated by Follicular Factors. By TORBJÖRN HILLENSJÖ, MATS BRÄNNSTRÖM, SREEMATHI CHARI, ERHARD DAUME, CLAES MAGNUSSON, LARS NILSSON, ANITA SJÖGREN, and JAN TÖRNELL ..	73
Modification of the Nucleolar Structure of the Rat Oocyte Observed Just before Maturation. By C. MERVEILLE, E. BAECKELAND, and A. M. LENARD ..	80
Polyspermy in <i>in Vitro</i> Fertilization of Human Oocytes: Frequency and Possible Causes. By HANS H. VAN DER VEN, SAFAA AL-HASANI, KLAUS DIEDRICH, ULRIKE HAMERICH, FRANK LEHMANN, and DIETER KREBS	88

^aThe papers in this volume were presented at the III World Congress of *in Vitro* Fertilization and Embryo Transfer sponsored by the International Federation of Gynecology and Obstetrics and held in Helsinki, Finland on May 14-17, 1984.

Part III. Endocrinologic Aspects, Follicular Growth, and Stimulation

Selection of Agents for Enhanced Follicular Recruitment in an <i>in Vitro</i> Fertilization and Embryo Replacement Treatment Program. <i>By MARTIN M. QUIGLEY</i>	96
Use of Various Ovarian Stimulation Methods to Improve Oocyte and Embryo Production for Human <i>in Vitro</i> Fertilization. <i>By RICHARD P. MARRS, JOYCE M. VARGYAS, DAVID HOFFMAN, and BILL YEE</i>	112
Specific Effects of FSH and LH on Follicular Development and Oocyte Retrieval as Determined by a Program for <i>in Vitro</i> Fertilization. <i>By G. E. SEEGAR JONES, A. A. ACOSTA, J. E. GARCIA, and ZEV ROSENWAKS</i>	119
Ovarian Stimulation Regimens in an <i>in Vitro</i> Fertilization Program: A Comparative Analysis. <i>By C. M. BAYLY, J. C. MCBAIN, G. A. CLARKE, M. J. GRONOW, W. I. H. JOHNSTON, M. J. MARTIN, and A. L. SPEIRS</i>	123
Comparative Effects of Clomiphene and Clomiphene/hMG on the Preovulatory Follicles and Fertilizability of the Oocyte. <i>By JACQUES TESTART, BRIGITTE LEFÈVRE, MICHEL CASTANIER, JOELLE BELAISCH-ALLART, FRÉDÉRIQUE GUILLET-ROSSO, and RENÉ FRYDMAN</i>	128
An Analysis of Endocrine Indices That May Identify Conceptual Cycles Prospectively in an <i>in Vitro</i> Fertilization Program. <i>By J. C. MCBAIN, D. LEVRAN, M. J. MARTIN, C. M. BAYLY, A. LOPATA, G. A. CLARKE, A. L. SPEIRS, P. NAYUDU, Y. P. DU PLESSIS, and W. I. H. JOHNSTON</i>	140
Is Ultrasound Monitoring of Follicular Growth Harmless? <i>By A. DEMOULIN, R. BOLOGNE, J. HUSTIN, and R. LAMBOTTE</i>	146
Effect of Clomiphene on the Functional Morphology of Oviductal and Uterine Mucosa. <i>By ARIE BIRKENFELD, MARTINA WEBER-BENNDORF, URSULA MOOTZ, and HENNING M. BEIER</i>	153
High-Dose Human Menopausal Gonadotropin Therapy for Successful Ovulation Induction for <i>in Vitro</i> Fertilization in Perimenopausal Women. <i>By JAN FRIBERG and NORBERT GLEICHER</i>	168

Part IV. Oocyte Retrieval

Laparoscopy for Oocyte Recovery. <i>By P. STEPOE and J. WEBSTER</i>	178
Transvesical and Transvaginal Approaches for the Aspiration of Follicles by Use of Ultrasound. <i>By MATTS WIKLAND, LENNART ENK, and LARS HAMBERGER</i>	182

Part V. Natural and Culture Environments of Germ Cells

Culture Factors Affecting the Success Rate of <i>in Vitro</i> Fertilization and Embryo Transfer. <i>By P. QUINN, G. M. WARNES, J. F. KERIN, and C. KIRBY</i>	195
Pregnancy-Associated Plasma Protein-A (PAPP-A) in Preovulatory, Nonovulatory Healthy, and Atretic Human Ovarian Follicles during the Natural Cycle. <i>By L. WESTERGAARD, M. J. SINOSICH, J. G. GRUDZINSKAS, T. BOLTON, K. P. MCNATTY, D. M. SAUNDERS, B. TEISNER, and J. WESTERGAARD</i>	205

Pregnancy Proteins in Seminal Plasma, Seminal Vesicles, Preovulatory Follicular Fluid, and Ovary. By MARKKU SEPPÄLÄ, AARNE I. KOSKIMIES, ANSSI TENHUNEN, Eeva-MARJA RUTANEN, JARI SJÖBERG, RIITTA KOISTINEN, MERVI JULKUNEN, and TORSTEN WAHLSTRÖM.....	212
Prolactin and Sex Steroid Concentrations in Follicular Fluids after Different Ovarian Stimulation Methods in IVF Patients. By H. G. BOHNET, V. BAUKLOH, P. KEMETER, and W. FEICHTINGER.....	227
A Possible Role of Vasopressin in the Control of Ovarian Activity. By REIJO H. PUNNONEN, OSMO VIINAMÄKI, ERKKI T. KUJANSUU, PENTTI K. HEINONEN, and PAAVO P. PYSTYNNEN	236
Biocides in Human Follicular Fluid. By V. BAUKLOH, H. G. BOHNET, M. TRAPP, W. HEESCHEN, W. FEICHTINGER, and P. KEMETER	240
The Origin and Distribution of Cortical Granules in Human Oocytes with Reference to Golgi, Nucleolar, and Microfilament Activity. By A. H. SATHANANTHAN, S. C. NG, C. M. CHIA, H. Y. LAW, W. R. EDIRISINGHE, and S. S. RATNAM	251
C-Type Retrovirus-Related P-30 Protein in Human Follicular Fluids: Relation to Follicular Steroids. By E. LARSSON, J. SUNI, A. VAHERI, P. SUNDSTRÖM, and O. NILSSON.....	265
Pregnancy-Associated Plasma Protein-A and Placental Protein 5 in Human Ovarian Follicular Fluid. By M. J. SINOSICH, D. M. SAUNDERS, and J. G. GRUDZINSKAS	269

Part VI. Andrology and *in Vitro* Fertilization

The Management of Oligospermic Infertility by <i>in Vitro</i> Fertilization. By JOHN L. YOVICH, JAMES D. STANGER, and JEANNE M. YOVICH.....	276
Pregnancy-Associated Plasma Protein-A and Placental Protein 5 in Human Seminal Plasma. By MICHAEL J. SINOSICH, MARKKU SEPPÄLÄ, DOUGLAS M. SAUNDERS, and JURGIS G. GRUDZINSKAS	287
Successful Use of <i>in Vitro</i> Fertilization for Patients with Persisting Low-Quality Semen. By M. M. MAHADEVAN, J. F. LEETON, A. O. TROUNSON, and C. WOOD	293
Absence of Sperm Antibodies in Follicular Fluid of Women Having Sperm Agglutinins in Serum. By JYRKI J. O. SUOMINEN and VESA NIKKANEN	301
Successful <i>in Vitro</i> Fertilization with Sperm Cells from a Man with Immune Infertility. By N. NAAKTGEBOREN, P. DEVROEY, and A. C. VAN STEIRTEGHEM.....	304
Sperm Phagocytosis by Corona Cells in a Human <i>in Vitro</i> System. By R. PIJNENBORG, S. GORDTS, R. ONGKOWIDJOJO, and I. BROSENS	310
An Economic and Ethical Way to Introduce <i>in Vitro</i> Fertilization to Infertility Practice, and Findings Related to Postcoital Sperm/Mucus Penetration in Isolated Tubal, "Cervical," and Unexplained Infertility. By M. G. R. HULL, D. N. JOYCE, F. N. MCLEOD, B. D. RAY, and A. McDERMOTT.....	318

Part VII. Factors Affecting Extracorporeal Maturation, Fertilization, and Development

Ultrastructure of Maturing Human Oocytes. By P. SUNDSTRÖM, B. O. NILSSON, P. LIEDHOLM, and E. LARSSON	324
Hormonal Correlates with Polyspermy. By BOBBY W. WEBSTER, ANNE COLSTON WENTZ, KEVIN G. OSTEEN, B. JANE ROGERS, and WILLIAM K. VAUGHN	332
Impairment of Human Embryo Development after Abnormal <i>in Vitro</i> Fertilization. By MICHELLE PLACHOT, JACQUELINE MANDELBAUM, ANNE-MARIE JUNCA, JACQUES SALAT-BAROUX, and JEAN COHEN	336
Factors Influencing Human Embryonic Development <i>in Vitro</i> . By SIMON B. FISHEL, JACQUES COHEN, CAROLE FEHILLY, JEAN M. PURDY, D. EUROF WALTERS, and ROBERT G. EDWARDS	342
Extracorporeal Maturation: Norfolk, 1984. By LUCINDA L. VEECK	357

Part VIII. Embryo Replacement

<i>In Vitro</i> Studies of Human Blastocyst Implantation. By SVEND LINDEBERG, MORTEN H. NIELSEN, and SUZAN LENZ	368
Embryo Transfer. By HOWARD W. JONES, JR.....	375
Aspects of Multiple Embryo Transfer. By MICHAEL J. GRONOW, MARION J. MARTIN, JOHN C. MCBAIN, PETER WEIN, ANDREW L. SPEIRS, and ALEXANDER LOPATA	381

Part IX. Luteal Phase and the Endometrium

Is the Short Luteal Phase a Defective Luteal Phase? By STEPHEN K. SMITH, ELIZABETH A. LENTON, BRITT-MARIE LANDGREN, and IAN D. COOKE	387
The Luteal Phase after Hyperstimulation for <i>in Vitro</i> Fertilization. By MICHAEL J. GRONOW, MARION J. MARTIN, DAVID HAY, DEBBIE MORO, and JAMES B. BROWN	391
Pregnancy Proteins in the Endometrium after Follicle Aspiration for <i>in Vitro</i> Fertilization. By T. WAHLSTRÖM, A. I. KOSKIMIES, A. TENHUNEN, E.-M. RUTANEN, H. YKI-JÄRVINEN, M. JULKUNEN, J. SJÖBERG, and M. SEPPÄLÄ	402
Clomiphene-Induced Changes in Endometrial Receptor Kinetics on the Day of Ovum Collection after Ovarian Stimulation: A Study on Cytosol and Nuclear Estrogen and Progestin Receptors and 17 β -Hydroxysteroid Dehydrogenase. By LARS RÖNNBERG, HANNU ISOTALO, ANTTI KAUPPILA, HANNU MARTIKAINEN, and REIJO VIHKO	408

Part X. Early Stages of Embryo Development

Ultrastructure of a Two-Cell Human Embryo Fertilized <i>in Vivo</i> . By JAIME PEREDA and MARIO COPPO	416
Monitoring Embryos after <i>in Vitro</i> Fertilization Using Early Pregnancy Factor. By CHRISTOPHER CHEN, WARREN R. JONES, FERN BASTIN, and CARON FORDE	420

- Maternal Recognition of Pregnancy prior to Implantation: Methods for Monitoring Embryonic Viability *in Vitro* and *in Vivo*. By CHRISTOPHER O'NEILL, IAN L. PIKE, RICHARD N. PORTER, A. ANGUS GIDLEY-BAIRD, MICHAEL J. SINOSICH, and DOUGLAS M. SAUNDERS** 429

- Monitoring of Postimplantation Embryo Viability by Measurement of PAPP-A, SP1, and hCG. By MICHAEL J. SINOSICH, ALAN FERRIER, and DOUGLAS M. SAUNDERS.....** 440

- Ultrasonic and Hormonal Evaluation of Luteal Phases and Early Ongoing Pregnancies after *in Vitro* Fertilization and Embryo Replacement. By WILFRIED FEICHTINGER and PETER KEMETER** 445

Part XI. Genetics and IVF

- Chromosomal Preparations from Human Oocytes. By H. WRAMSBY, K. FREDGA, and P. LIEDHOLM.....** 455

- Chromosome Studies of Early Human Embryos: Proof of Fertilization in Uncleaved Human Oocytes. By L. METTLER and H. W. MICHELmann** 458

- Genetic Aspects of *in Vitro* Fertilization. By JOSEPH D. SCHULMAN, ANDREW DORFMANN, and MARK I. EVANS** 466

- Chromosome Analysis of Human Oocytes and Embryos Fertilized *in Vitro*. By EDWINA RUDAK, JEHOSHUA DOR, SHLOMO MASHIACH, LASLO NEBEL, and BOLESLAV GOLDMAN** 476

Part XII. The Selection and Preparation of Couples for IVF

- The Selection of Couples for *in Vitro* Fertilization and Embryo Replacement. By PATRICK STEPTOE** 487

- Patient Selection for *in Vitro* Fertilization: Physical and Psychological Aspects. By W. I. H. JOHNSTON, K. OKE, A. SPEIRS, G. A. CLARKE, J. MCBAIN, C. BAYLY, J. HUNT, and G. N. CLARKE** 490

- Psychological Interviews in Screening Couples Undergoing *in Vitro* Fertilization. By F. P. HASELTINE, C. MAZURE, W. DE L'AUNE, D. GREENFELD, N. LAUFER, B. TARLATZIS, M. L. POLAN, E. E. JONES, R. GRAEBE, F. NERO, A. D'LUGI, D. FAZIO, J. MASTERS, and A. H. DECHERNEY.....** 504

- Psychosocial Testing and Pretreatment of Women for *in Vitro* Fertilization. By PETER KEMETER, ANSELM EDER, and MARIANNE SPRINGER-KREMSE** 523

- The Impact of *in Vitro* Fertilization on Tubal Surgery for Complete Fimbrial Obstruction. By M. E. BOER-MEISEL, E. R. TE VELDE, J. D. F. HABBEMA, and J. W. P. F. KARDAUN** 533

Part XIII. New Developments, Technical Aspects, and Clinical Management

- Cryopreservation of Human Embryos. By LINDA R. MOHR and ALAN O. TROUNSON** 536

- Monitoring the LH Surge by Ultrarapid and Highly Sensitive Immunofluorometric Assay. By ULF-HÅKAN STENMAN, HENRIK ALFTHAN, AARNE KOSKIMIES, MARKKU SEPPÄLÄ, KIM PETTERSSON, and TIMO LÖVGREN** 544

Use of a Modified Test System to Determine Early Pregnancy Factor (EPF) Levels in Patients with Normal First Trimester Pregnancy and after Therapeutic Abortion. By H. R. TINNEBERG, R. P. STAVES, V. HANF, W. SCHOLZ, K. SEMM, and L. METTLER.....	551
--	-----

Part XIV. Current State of the Art

The World Collaborative Report on <i>in Vitro</i> Fertilization and Embryo Replacement: Current State of the Art in January 1984. Compiled by MARKKU SEPPÄLÄ <i>et al.</i>	558
--	-----

Part XV. Ethical and Moral Issues of *in Vitro* Fertilization

Introduction: The Scientific Basis of Ethics. By R. G. EDWARDS	564
Helsinki Statement on Human <i>in Vitro</i> Fertilization. By R. G. EDWARDS <i>et al.</i>	571
Historical Aspects of the Ethics of <i>in Vitro</i> Fertilization. By PATRICK STEPTOE..	573
Ethics of <i>in Vitro</i> Fertilization: 1984. By HOWARD W. JONES, JR.....	577
Bioethical Decision-Making: Which Path to Choose? By DANIEL CH. OVERDUIN	583
Ethical and Moral Issues of <i>in Vitro</i> Fertilization. By MIKKO JUVA	585
The Ethics of the Reproduction Revolution. By PETER SINGER.....	588
A Practical Ethical Framework for <i>in Vitro</i> Fertilization and Related Reproductive Interventions. By ROBERT P. S. JANSEN	595
Jewish and Moslem Aspects of <i>in Vitro</i> Fertilization and Embryo Transfer. By JOSEPH G. SCHENKER	601
Index of Contributors.....	609
Subject Index	613

Financial assistance was received from:

- LEIRAS/SCHERING, TURKU, FINLAND
- SERONO LABORATORIES, INC., RANDOLPH, MASSACHUSETTS
- SERONO SYMPOSIA, RANDOLPH, MASSACHUSETTS
- WILLIAM A. COOK AUSTRALIA PTY, LTD., MELBOURNE

The New York Academy of Sciences believes it has a responsibility to provide an open forum for discussion of scientific questions. The positions taken by the participants in the reported conferences are their own and not necessarily those of The Academy. The Academy has no intent to influence legislation by providing such forums.

